

B.Sc. II - Semester Examination

CBS-IIs/4(P)

24529

CHEMISTRY

Course No. : UCHTC-201

Time Allowed- 2½ Hours

Maximum Marks-80

SECTION - A

Attempt All questions, each question carry 3 marks. (5×3=15)

1. Explain bond energy and bond dissociation energy.
2. Explain enthalpy of neutralization.
3. Calculate K_p of the following gas-phase reaction at temperature T :
$$2N_2O_5(g) \rightleftharpoons O_2(g) + 4NO_2(g)$$

(Given: partial pressures for each component at equilibrium is $N_2O_5 = 2.00\text{atm}$; $O_2 = 0.296\text{atm}$; $NO_2 = 1.70\text{atm}$)
4. Complete the reactions
 - a) $CH_3CH_2CH_2CH_2OH + HBr \rightarrow ?$
 - b) $CH_3 - CH_2 - \overset{\overset{O}{\parallel}}{C} - CH_3 \xrightarrow[(ii) H_3O^+]{(i) MeMgBr/THF} ?$
5. Draw the energy level diagrams for SN_1 and SN_2 reactions.

SECTION - B

Attempt All questions, each question carry 7 marks. (5×7=35)

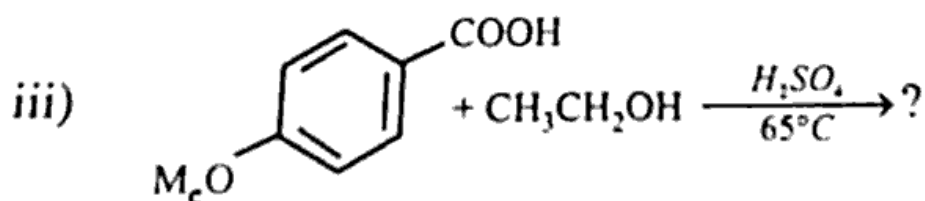
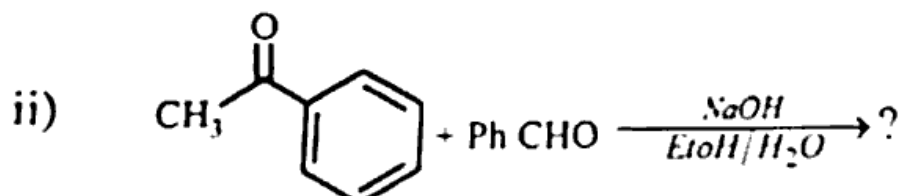
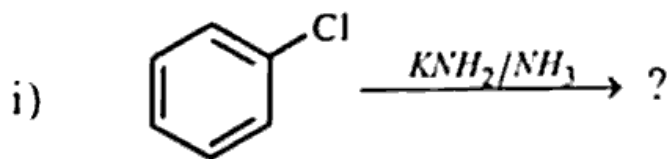
6. Give the mechanism of Friedel-Craft's alkylation of benzene.
7. Give the mechanism of Benzoin condensation taking the example of benzaldehyde.
8. State and explain third law of thermodynamics. How it can be verified experimentally?
9. State and explain Le Chatelier's principle. What is the effect of pressure in the given reaction? $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$
10. What are buffer solutions? Explain acidic and basic buffer solutions.

SECTION - C

Attempt any two questions, each question carries 15 marks.

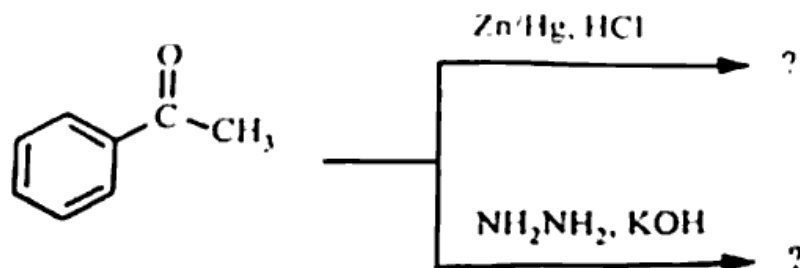
(2×15=30)

11. Write down the product along with mechanism of the following reactions. (3×5=15)

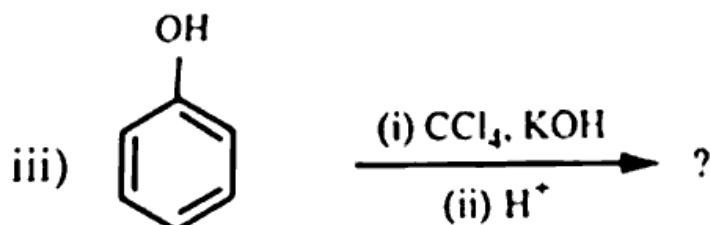
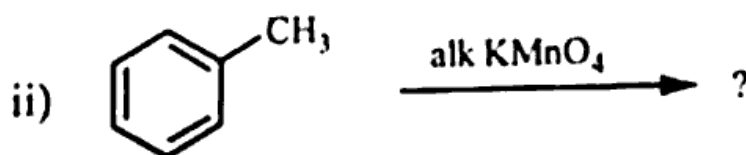
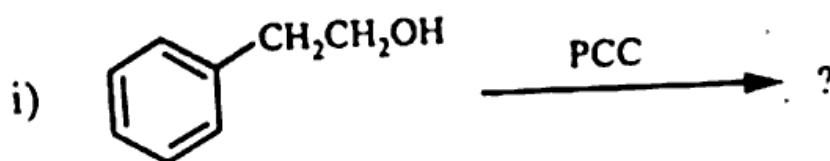


12. a) Outline a Witting synthesis of Styrene (5)

b) Complete and give mechanism of the following reactions: (5,5)



13. a) Complete the following reactions: (3×2.5)



b) Explain solubility product of sparingly soluble salts. (7.5)

[Turn Over